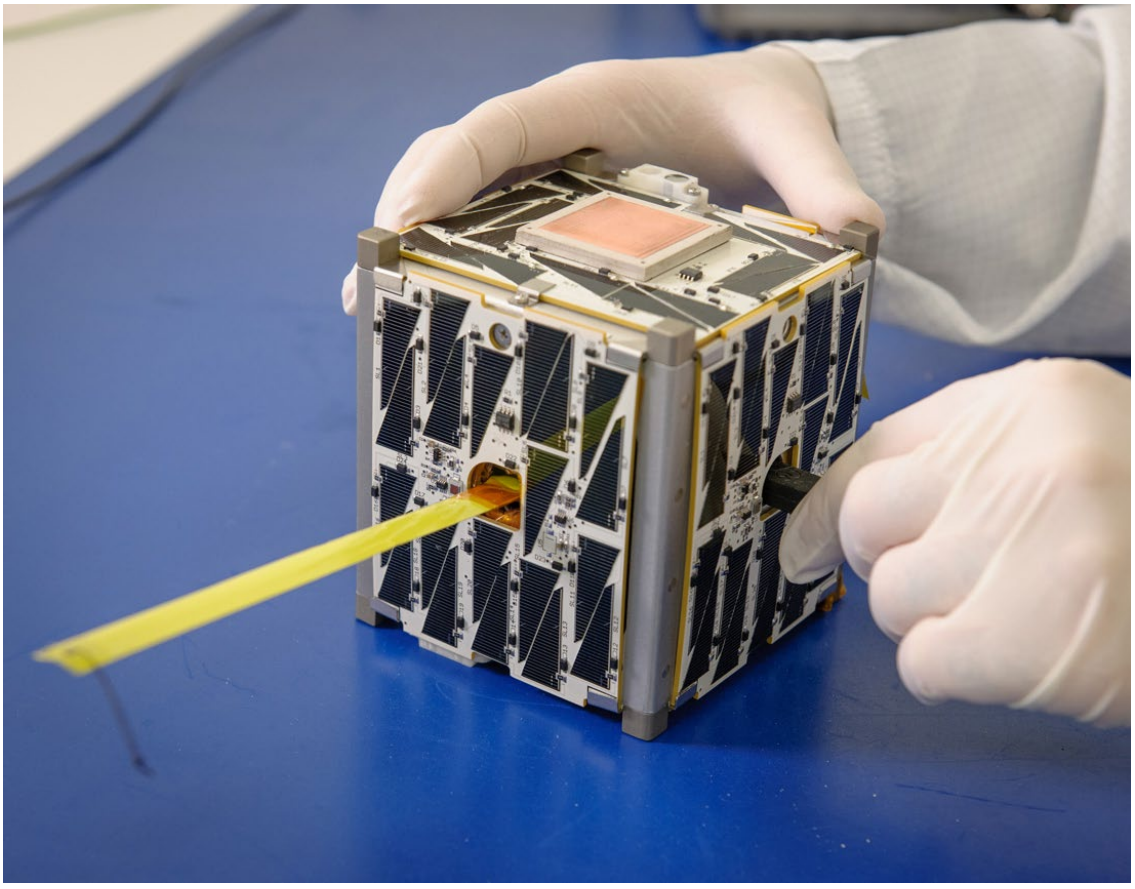
NASAfacts

Smallsat Technology Partnerships

The Small Spacecraft Technology Program (SSTP) supports partnerships between universities and NASA Centers through its Smallsat Technology Partnerships activity to work collaboratively on projects to develop and demonstrate new technologies and capabilities and to spur innovation in communication, navigation, propulsion, power, science capabilities, and advanced manufacturing for small spacecraft. The goal of these efforts is to transform small spacecraft, some of which weigh only a few kilograms, into powerful but affordable tools for science, exploration and space operations.

In 2013 the SSTP selected 13 partnership teams to collaborate in these areas with NASA. Selected project teams include members from 17 universities who are working with engineers and scientists from seven NASA field centers. Results from these projects could lead to the development of miniature radio and navigation devices, low-power laser communications, and radiation-tolerant computers. Additional emerging concepts could include energy storage devices and electric propulsion for deep space missions.

The SSTP is managed by Ames Research Center, located at Moffett Field, California. The program develops and demonstrates new capabilities employing the unique features of small



PhoneSat 2.5 Image Credit: NASA Ames Research Center / Dominic Hart

spacecraft for science, exploration and space operations. The SSTP expects to repeat the Smallsat Technology Partnerships solicitation every two years, contingent on the availability of appropriated funds. Selected teams and projects for the 2013 Smallsat Technology Partnerships include:

COMMUNICATIONS

High Rate Cubesat X-band/S-band Communication System
- University Of Colorado
- NASA Partners: Goddard Space Flight Center, Marshall Space Flight Center

Space Optical Communications Using Laser Beam Amplification
- University Of Rochester
- NASA Partner: Ames Research Center

Development of Novel Integrated Antennas for Cubesats
- University Of Houston
- NASA Partner: Johnson Space Center

GUIDANCE, NAVIGATION AND CONTROL

Smallsat Precision Navigation With Low-Cost MEMS IMU Swarms
- West Virginia University
- Partner: Marquette University
- NASA Partner: Johnson Space Center

Cubesat Autonomous Rendezvous & Docking Software
- University Of Texas
- NASA Partner: Johnson Space Center

Radiation Tolerant, FPGA-based Smallsat Computer System
- Montana State University
- NASA Partners: Goddard Space Flight Center, Marshall Space Flight Center

An Integrated Precision Attitude Determination and Control System
- University Of Florida
- NASA Partner: Langley Research Center

PROPULSION

Propulsion System and Orbit Maneuver Integration in Cubesats
- Western Michigan University
- NASA Partner: Jet Propulsion Lab

Film-Evaporation MEMS Tunable Array for Picosat Propulsion and Thermal Control
- Purdue University
- NASA Partner: Goddard Space Flight Center

POWER

Smallsat Low Mass, Extreme Low Temperature Energy Storage
- California State University - Northridge
- NASA Partner: Jet Propulsion Lab

SCIENCE INSTRUMENT CAPABILITIES

Compressive Sensing for Advanced Imaging and Navigation
- Texas A&M University
- NASA Partner: Langley Research Center

Mini Fourier-Transform Spectrometer for Cubesat-Based Remote Sensing
- Appalachian State University
- Partner: University of Maryland - Baltimore County
- NASA Partner: Goddard Space Flight Center

ADVANCED MANUFACTURING

Printing the Complete Cubesat
- University Of New Mexico
- Partners: University of Texas - El Paso and Drake State Technical College
- NASA Partner: Glenn Research Center

For more information about the SSTP, visit:
http://www.nasa.gov/smallsats

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SSTP
Small Spacecraft Technology Program